

INSTALLATION INSTRUCTION FOR HEAT RECOVERY VENTILATOR (HRV)

Shipping and Packing List

Package 1 of 1 contains:

1 - Assembled ventilator

1 - Bag assembly containing:

- 4 - Hanging straps
- 1 - Installation manual
- 1 - Remote electrical control box
- 1 - Bag containing sealant putty

Application

Heat Recovery Ventilators (HRV) are designed to provide fresh air while exhausting an equal amount of stale air.

The HRV is equipped with an aluminum core. The device uses the stale air that is being exhausted to condition the fresh air as it is being brought in.

Required Tools

Installation Tools

- tin snips
- assorted screw drivers
- electric drill
- hammer
- wire strippers
- knife
- caulking gun
- smoke pencil
- large zip ties
- fabric flexible duct
- class I rated
- mastic tape
- alum. foil duct tape
- zip ties
- 1/2" I.D. drain hose

Balancing Tools

- Pitot Tube Balancing Kit
[Case, 8 ft. vinyl tubing, Pitot tube, magnehelic gauge (0 - 0.25"), and mounting plate]
- or
- Pitot Tube with instructions and Digital Manometer (with resolution of 0 - 0.25" - must read to 1/100ths of an inch)

Optional Accessories

- 20 Minute Fan Timer
- Wall Mounted Dehumidistat
- Weather hood Kit
- Round Diffuser
 - 4" (100mm)
 - 5" (125mm)
 - 6" (150mm)
 - 8" (200mm)
- Kitchen Grille
 - may be required by code for kitchen applications
 - contains removable grease filter

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* LEAVE FOR HOMEOWNER

NOTE: Due to ongoing research and product development, specifications, ratings and dimensions are subject to change without notice. AA-CCU-001
0405





28 051

FILTERS

Washable air filters in exhaust and supply air streams.

MOUNTING THE HRV

Four threaded inserts at corners of case designed to accept four reinforced polyester straps that are supplied with the unit.

DEFROST

Recirculating damper defrost system. Exhaust air is periodically circulated through the unit to defrost the core.

CASE

Twenty gauge prepainted galvanized steel (G60) for superior corrosion resistance. Insulated to prevent exterior condensation. Drain connections- 1/2" (12 mm) OD.

CONTROLS - HRV System Control

HRV defaults to LOW SPEED when plugged in. HIGH SPEED is accessible by connecting remote controls to designated terminals inside electrical box of HRV.

Standard LOW SPEED SETTING can be increased by manipulating switches in electrical box. OFF/HIGH speed operation also available by manipulating switches.

WEIGHT

42 lbs. (19 kg.) **SHIPPING WEIGHT** 45 lbs. (20.5 kg.)

ORDERING INFORMATION

PART NUMBER: 28 051

OPTIONAL ACCESSORIES:

28 884 20 Minute Fan timer -- White, Decora style (3 wire) 20

gauge wire (min.) 100' length (max.)

28 998 60 min. Twist Timer with hold, white Decora style

22 025 Weather Hoods, 2 - 5 (125mm) c/w 1/4 (6mm) screen

28 883 Dehumidistat Ventilation Control - Dehumidistat with ON/OFF

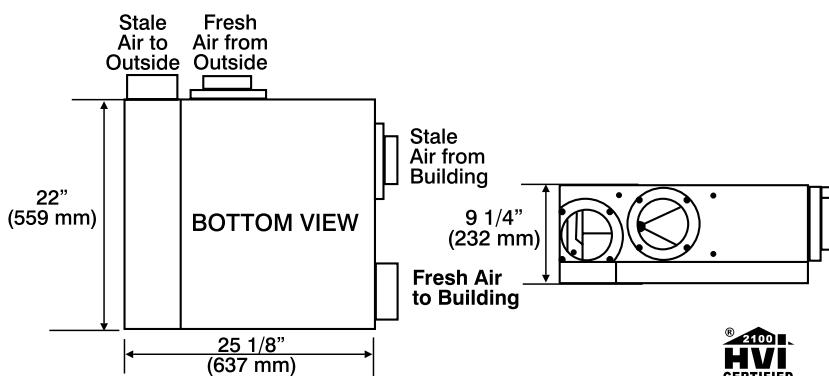
28 882 Dehumidistat Control - Dehumidistat

All units conform to CSA and UL standards.

DUCT CONNECTIONS

5" duct connections.

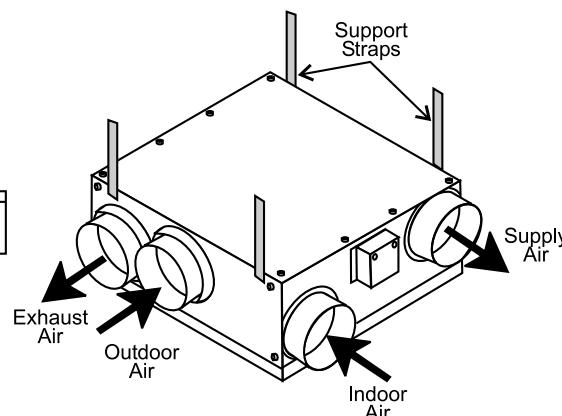
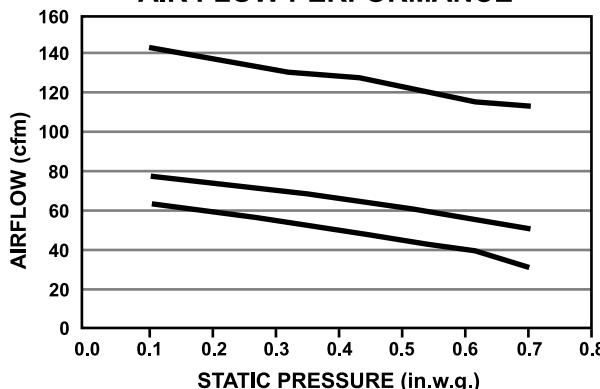
DIMENSIONS inches

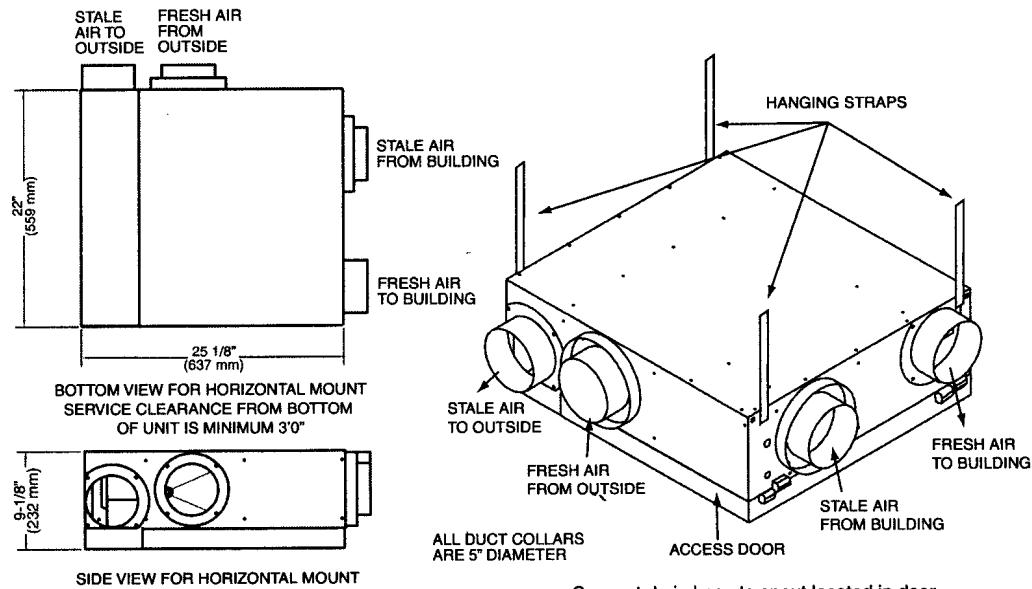
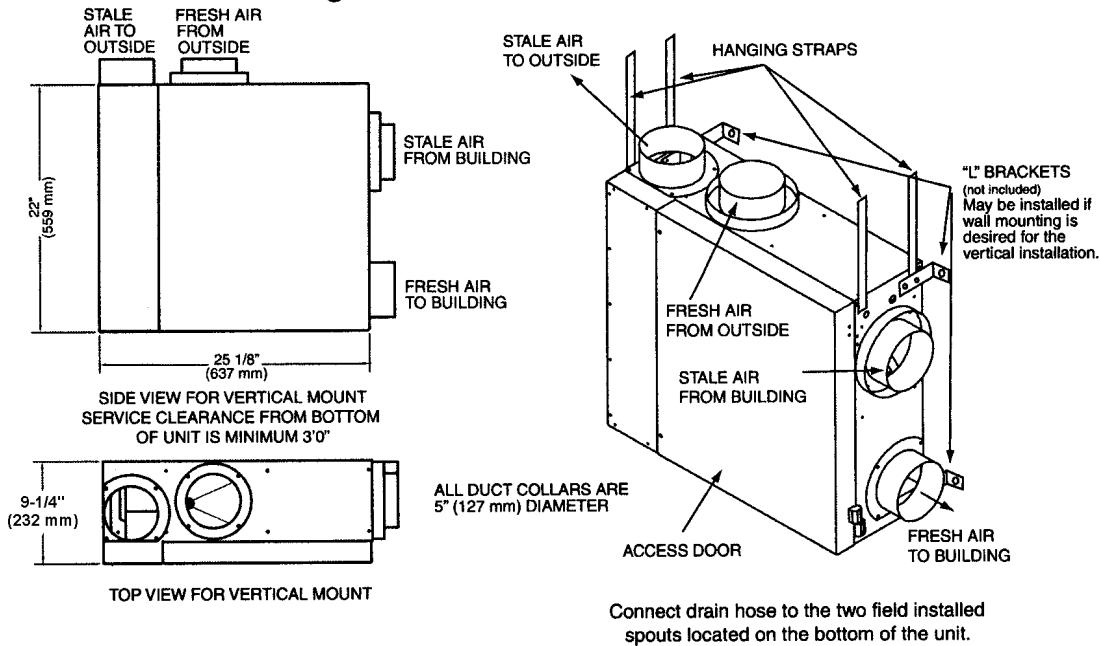


PERFORMANCE

E.S.P. (in.wg.)	CFM	L/S
0.1	143	68
0.2	138	65
0.3	132	62
0.4	128	61
0.5	123	58
0.6	116	55
0.7	113	54
0.8	106	50
0.9	103	48
1.0	97	46
Max. Temperature Recovery		
72%		
Sensible Effectiveness @ 70 CFM (32°F):		
68%		
Sensible Efficiency @ 70 CFM (32°F):		
59%		
Sensible Efficiency @ 67 CFM (-13°F):		
56%		
VAC @ 60 Hz:		
120		
Watts / Low Speed:		
70		
Watts / High Speed:		
160		
Amp Rating		
1.5		

AIR FLOW PERFORMANCE



Option 1 - Horizontal Duct Configuration Dimensions inches**Option 2 - Vertical Duct Configuration Dimensions** inches

Clearances and Requirements

⚠ WARNING

Before installation, careful consideration must be given to how this system will operate if connected to any other piece of mechanical equipment, i.e. a forced air furnace or air handler, operating at a higher static. After installation, the compatibility of the two pieces of equipment must be confirmed, by measuring the air flows of the ventilator, by using the balancing procedure found in this manual.

It is always important to assess how the operation of any HRV may interact with vented combustion equipment (i.e. Gas Furnaces, Oil Furnaces, Wood Stoves, etc.)

NEVER install a ventilator in a situation where its normal operation, lack of operation or partial failure may result in the backdrafting or improper functioning of vented combustion equipment!!!

Connecting Appliances to the HRV

The following appliances should not be connected to the HRV:

- clothes dryer
- range top
- stovetop fan
- central vacuum system

⚠ CAUTION

Lint, dust or grease will collect in the HRV damaging the unit.

NOTE: Connecting any of these to the HRV will invalidate your warranty.

Installation

⚠ WARNING

Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury or loss of life. Installation and service must be performed by a qualified installer or service agency.

⚠ WARNING

 Electric shock hazard. Can cause injury or death. Before attempting to perform any service or maintenance, turn the electrical power to unit OFF at disconnect switch(es). Unit may have multiple power supplies.

Location Selection

The HRV must be located in a heated space where it will be possible to conveniently service the unit. Typically the HRV would be located in the mechanical room or an area close to the outside wall where the weather hoods will be mounted. If a basement area is not convenient or does not exist, a utility or laundry room may be used.

Attic installations are not normally recommended due to:

- A) the complexity of work to install
- B) freezing conditions in the attic
- C) difficulty of access for service and cleaning

The HRV unit must be installed in the positions as shown in the illustrations on page 6. The unit should be suspended using the provided hanging straps. **The unit must be level for proper condensate drainage.** Sufficient clearance below the access door is required for servicing the air filters and core. A minimum of 25" (635mm) clearance is recommended so the door can be removed. Four PVC reinforced polyester hanging straps are provided for hanging the HRV.

Suspending the Unit

The hanging straps should be attached to the unit at the top end corners (mounting screws are already located on the HRV case). Securely fasten the other end of the straps to the ceiling making sure the UNIT IS LEVEL. The straps are designed to reduce the possibility of noise, resonance or harmonics; therefore using the full length of the strap between the HRV and the floor joists is recommended.

Weather Hood Location and Installation

Weatherhood kit includes two fixed-cover hoods with a 1/4" (6mm) mesh screen.

Exhaust Weather Hood Requirements

- At least 6' (2 m) from the ventilation air intake*
- At least 18" (460mm) above ground or above the depth of expected snow accumulation*
- At least 3' (1 m) away from the corner of the building*
- At least 3' away from gas meter, electric meter or a walkway where fog or ice could create a hazard*
- Not into a garage, workshop or other unheated space

Installation

⚠ CAUTION

Unit must be installed level to ensure proper condensate drainage. Due to the broad range of installation and operational conditions, consideration must be given for the possibility of condensation forming on the unit or connecting ducting. Objects below the installation may be exposed to condensate.

When installing the weather hood, its outside perimeter must be sealed with exterior caulking.

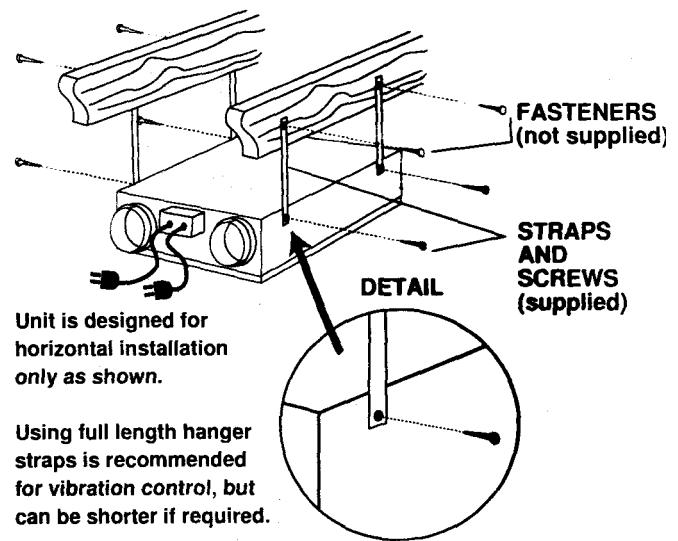
* Local code may require greater distances.

Intake Weather Hood Requirements

- Should be located upstream (if there are prevailing winds) from the exhaust outlet
- At least 6' (2 m) from the exhaust weather hood *
- At least 6' (2 m) away from dryer vents and air handler exhaust (medium or high efficiency furnaces)*
- A minimum of at least 6' (2 m) from driveways, oil fill pipes, gas meters, or garbage containers, swimming pools*
- At least 18" (460mm) above the ground, or above the depth of expected snow accumulation*
- At least 3' (1 m) from the inside/outside corner of the building*
- Do not locate in a garage, attic or crawl space

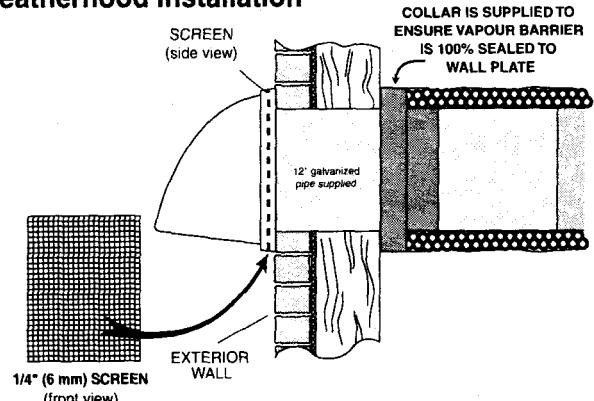
* Local code may require greater distances.

Suspending the Unit using the Provided Hanging Straps



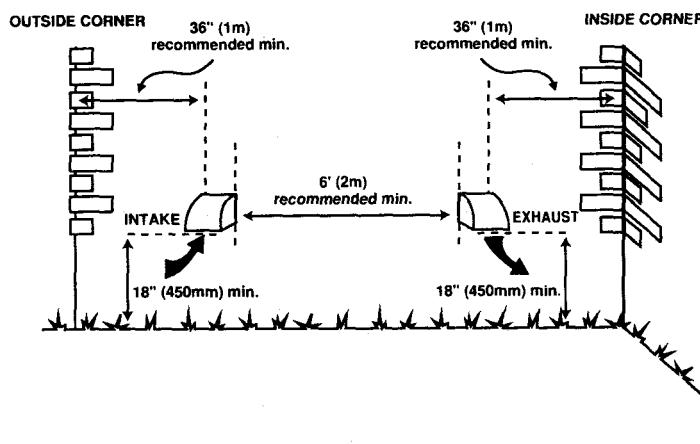
Note: Illustration depicts unit suspended from wood floor joists. If a different ceiling system is used, securing straps to floor will be different.

Weatherhood Installation



1. Thermal Collar slides over galvanized sleeve of Weatherhood.
2. Fasten Thermal Collar to Belt.
3. Slide the Insulated Flexible Ducting over the Weatherhood's galvanized sleeve and fasten it to the Thermal Collar.
4. Hood is hinged to allow for easy access for cleaning of bird screen.

Weather Hood Clearances

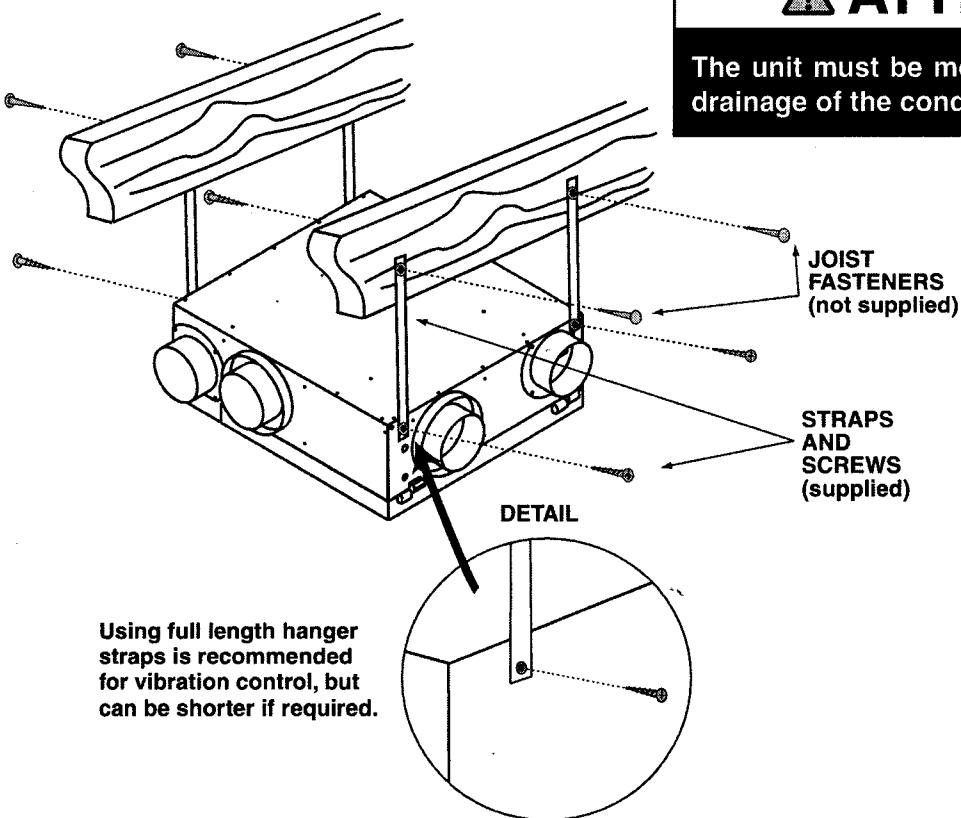


⚠ CAUTION

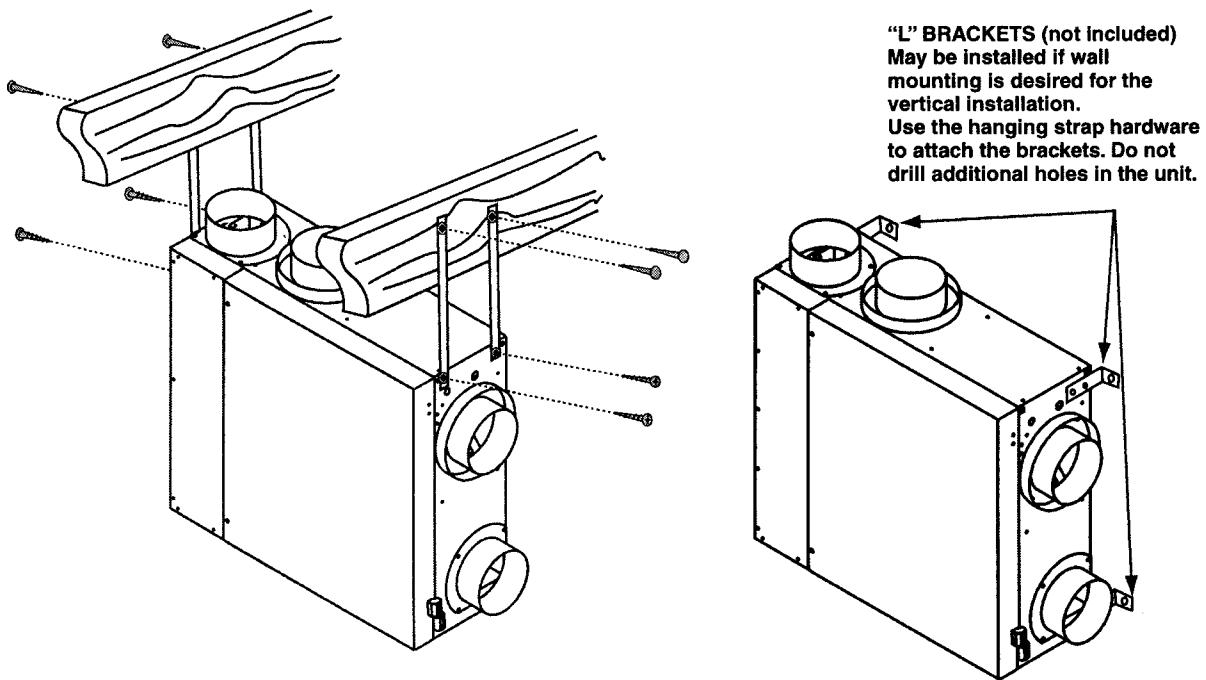
Weather hood arrangement - requires a minimum of 6' (2m) separation and a minimum of 18" (460mm) clearance above grade or anticipated snow level.

Hanging or Mounting the HRV

Horizontal Installation



Vertical Installation



Wall Mounting the HRV

Air Duct Design and Installation

A well designed and installed ducting system will allow the HRV to operate at its maximum efficiency.

Always try to keep duct runs as short and straight as possible. See Installation Diagrams for various installation options.

The inner and outer liners of the flexible insulated duct must be clamped to the sleeve of the weather hoods (as close to the outside as possible) and the appropriate port on the HRV. It is very important that the fresh air intake line be given special attention to make sure it is well sealed. A good bead of high quality caulking (preferably silicone sealant) will seal the inner flexible duct to both the HRV port and the weather hood prior to clamping with a large zip tie.

To minimize air flow restriction, the flexible insulated duct that connects the two outside weather hoods to the HRV should be stretched tightly and be as short as possible.

Twisting or folding the duct will severely restrict air flow. See below for the recommended connection of flexible insulated ducts to the the outside weather hoods and the HRV.

Installing the Ducting Between the HRV & Living Areas in the Home

To maximize airflow in the duct system, all ducts should be kept short and have as few bends or elbows as possible. Forty-five degree elbows are preferred to 90° elbows. Use "Y" tees instead of 90° elbows whenever possible.

All duct joints must be fastened with screws, rivets or duct sealant and wrapped with mastic or a quality duct tape to prevent leakage. Mastic is preferred but if duct tape is used, we recommend aluminum foil duct tape.

Galvanized ducting from the HRV to the living areas in the house is recommended whenever possible, although flexible duct can be used in moderation if necessary.

To avoid possible noise transfer through the duct system, a short length (approximately 12 inches or 300mm) of non-metallic flexible insulated duct should be connected between the HRV and the supply/exhaust duct system.

The main supply and return lines to/from the HRV must be the same size or larger than the duct connection collar. Branch lines to the individual rooms may be as small as 4 inches (100mm), but 5 inch (125mm) lines are preferred .

All ducts running through attics and unheated spaces must be sealed and insulated to code.

Fresh Air Ducting

In applications that do not include an air handler, fresh air should be supplied to all bedrooms and living areas, excluding bathrooms, kitchen and utility areas. Grilles should be located high on a wall or in ceiling locations.

WARNING

Include a short length of fabric flex duct or other non-metallic connector in this hard ducted line in order to keep the HRV separately grounded (electrically) from the air handler. This will avoid a possible shock hazard to service people if a short to ground develops in one of the devices.

Grilles that diffuse the air comfortably such as the ALGRILLE are recommended.

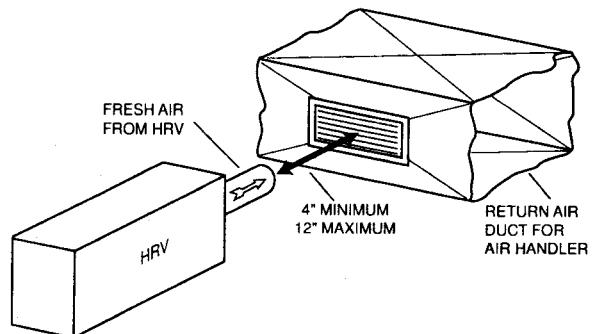
If the floor is the only option available, then special care should be taken in locating grilles. Areas such as under baseboard heaters will help to temper the air. Also optional inline duct heaters are available for mounting in the supply duct work to add heat if required.

Direct Connection to Air Handler Duct System

Should you wish to hard duct the fresh air from the HRV directly into the cold air return of the air handler, remember to check the air flow balance of the HRV with the air handler fan both "ON" and "OFF" to determine that it does not imbalance the unit more than 10%.

Indirect Connection to Air Handler Duct System

If permitted by local codes, an indirect connection may be made between the HRV fresh air duct and the air handler return plenum. The fresh air from the unit may be directed at a grille installed in the cold air return duct of the air handler. The fresh air outlet from the HRV should be no closer than 4 inches (100mm) and no more than 12 inches (300mm) from the grille.



Duct Design and Installation

Stale Air Exhaust System

The stale air exhaust system draws air from the points in the house where the worst air quality problems occur. Stale air ducts should be installed in the bathroom, kitchen, and laundry room. Applications such as greenhouses, atriums, swimming pools, saunas, etc. have unique ventilation requirements which should be addressed with an isolated ventilation system. Also, the air handler return duct may be used to exhaust from. In this method, the exhaust air is not ducted back to the HRV with "dedicated lines" from bathrooms, kitchens, etc. Instead, the exhaust air is drawn out of the cold air return of the air handler. **The air handler blower must be running when the unit is operating for this system to be effective.**

⚠ CAUTION

Do not mount exhaust grille within 4' (1.2m) (horizontally) from stove to prevent grease from entering HRV.

Balancing Dampers and Grilles

Balancing dampers and/or adjustable grilles should be used to balance the flow rates into and out of various rooms.

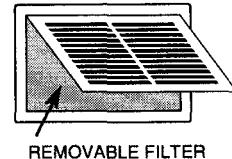
Grilles or diffusers should be positioned high on the wall or in the ceiling. Kitchen exhaust grilles must never be connected to a range hood. They should be installed at least 4 feet (1.2m) horizontally away from the stove. A hinged 6"X10" (150 X 250mm) rectangular kitchen exhaust grille is available. This grille includes a removable grease filter. Canadian building codes require that kitchen grilles be equipped with washable filters.

Field-supplied balancing dampers should be installed external to the unit to balance the amount of stale air being exhausted with the amount of fresh air being brought into the house. Refer to Air flow Balancing section.

Kitchen Grille

Part# 10-002 6" x 10" Kitchen Grille

Part# 10-002-02 Replacement Grease Filter



REMOVABLE FILTER

Round Diffusers

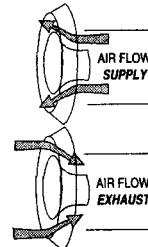
The Round Diffuser is available in

Part# 99-140 4" diameter Techgrille

Part# 99-141 5" diameter Techgrille

Part# 99-142 6" diameter Techgrille

Part# 99-148 8" diameter Techgrille



Drain Connections

Drain Connection (HRV Only)

During a defrost cycle, the HRV may produce some condensation. This water should flow into a nearby drain, or be taken away by a condensate pump.

⚠ CAUTION

The HRV and all condensate lines must be installed in a space where the temperature is maintained above the freezing point.

The HRV has condensate pans built into the door and the bottom of the unit. Use the applicable pans and spouts for your installation (vertical or horizontal). Drain spouts will have to be field installed for vertical set-up.

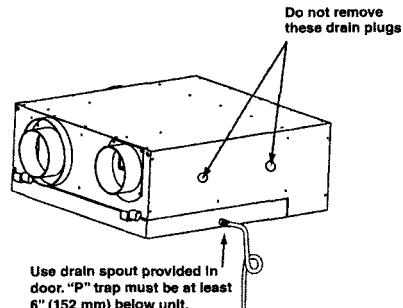
⚠ CAUTION

Drain trap and tubing MUST be below bottom of door with 1/4" per foot downwards slope away from unit.

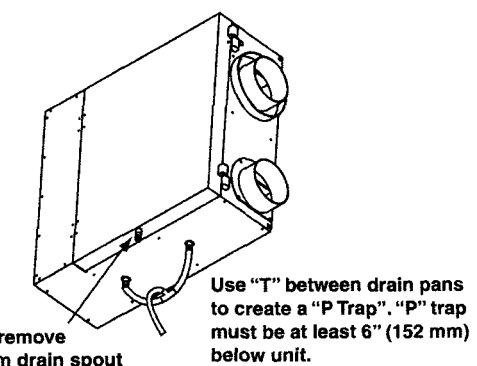
Install a loop or "P Trap" in the condensate line and pour a cup of water into the drain pan. This will create a water seal which will prevent odours from being drawn up the hose and into the fresh air supply of the HRV.

Note: Secondary drain pan may be required to protect from condensate leakage.

Drain Set-up for Horizontal Installation



Drain Set-up for Vertical Installation



Partially Dedicated System

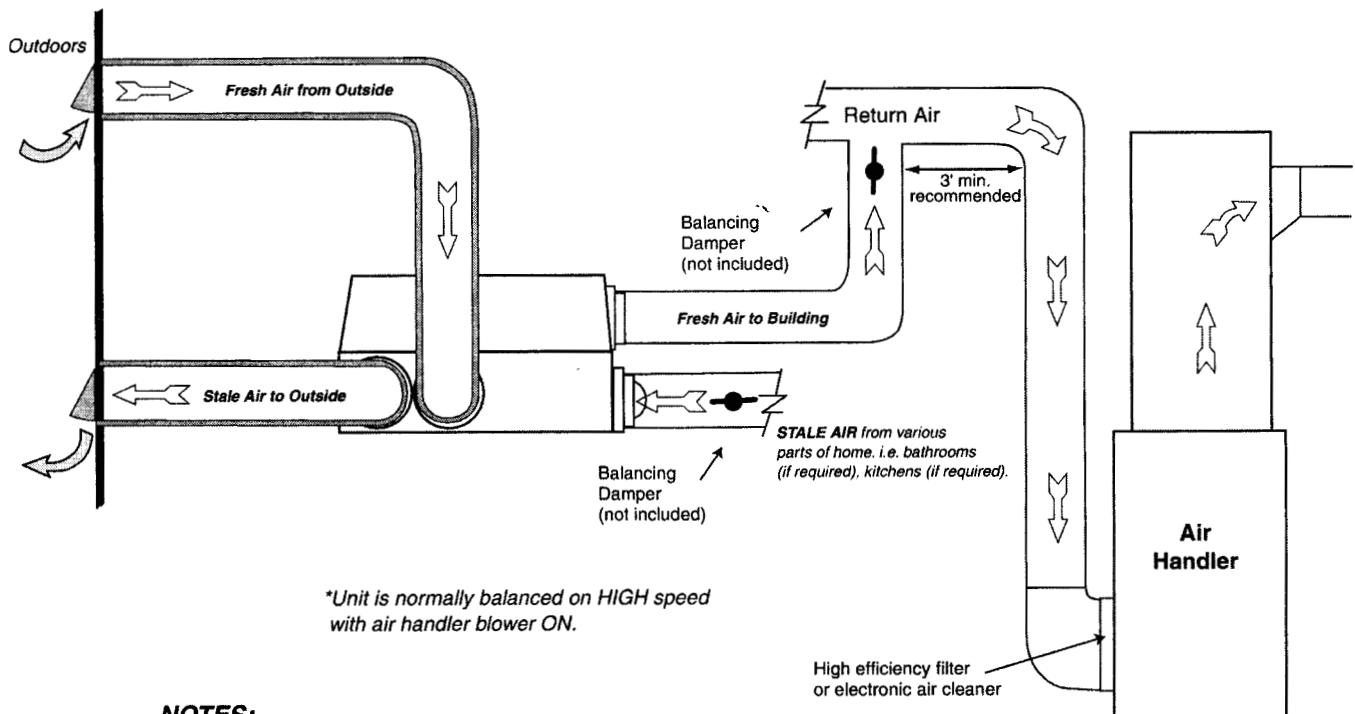
Partially Dedicated System for HRV

- Stale air drawn from key areas of home (bathroom, kitchen, laundry)
- Fresh air supplied to return air duct of air handler

⚠ WARNING

HRV must be balanced. Refer to "Airflow Balancing" in this manual.

DIRECT CONNECTION of the SUPPLY AIR STREAM to the AIR HANDLER COLD AIR RETURN (Stale air drawn from key areas of home)



*Unit is normally balanced on HIGH speed with air handler blower ON.

NOTES:

1. Air handler blower may be required to operate when HRV is on to provide good air distribution.
2. Weather hood arrangement is for drawing purposes only. 6' (2m) minimum separation required.
18" (460mm) above grade minimum or above anticipated snow level.
3. Due to the differences in pressure between the HRV and the equipment it is being connected to, the HRV air flow must be confirmed on site, using the balancing procedure found in the installation manual.

⚠ CAUTION

Weather hood arrangement - requires a minimum of 6' (2m) separation and a minimum of 18" (460mm) clearance above grade or anticipated snow level.

Simplified Installation

Simplified Installation for HRV

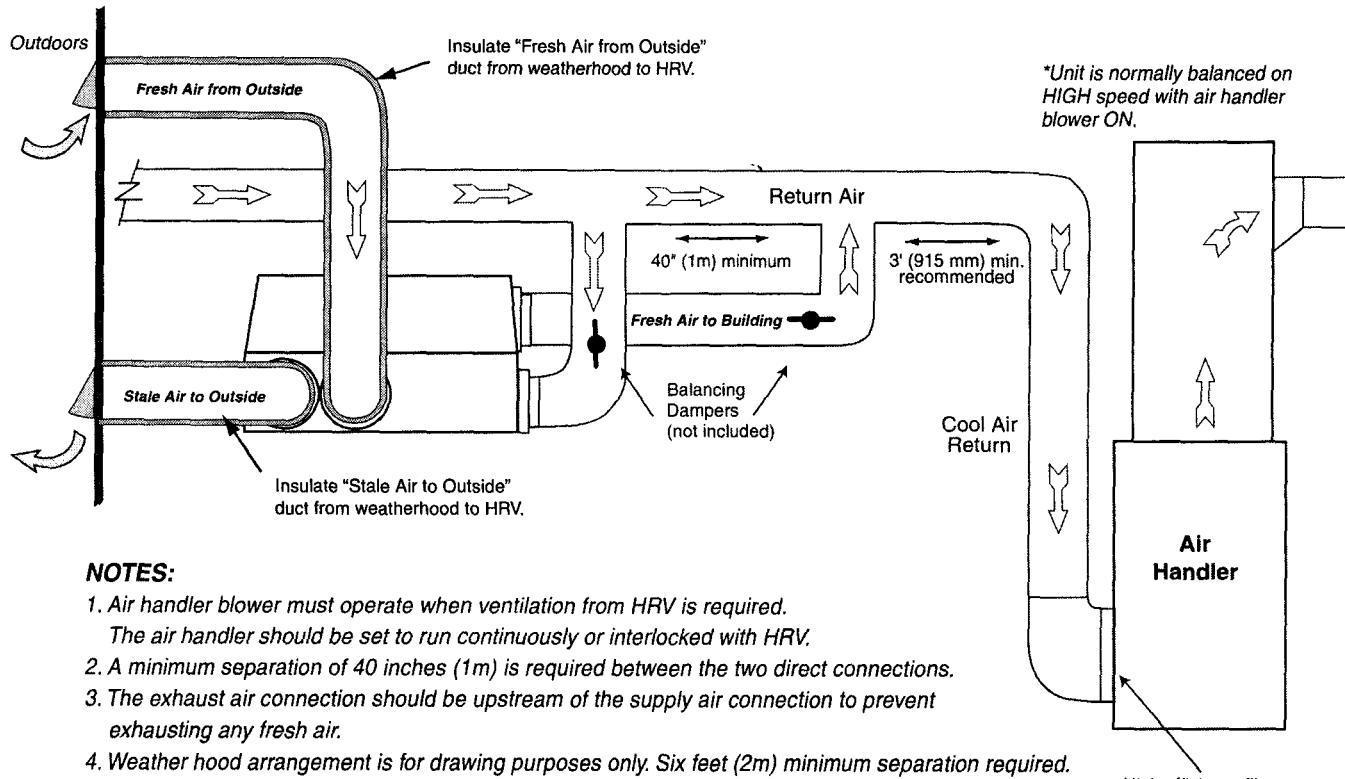
(Return/Return Method)

- It is mandatory that the air handler blower run continuously or HRV operation be interlocked with the air handler blower. Refer to "Interlocking HRV Operation to Airhandler/Furnace Blower" in this manual.
- Check local codes/authority having jurisdiction for acceptance.

⚠ WARNING

HRV must be balanced. Refer to "Airflow Balancing" in this manual

DIRECT CONNECTION of both the HRV SUPPLY AIR STREAM and EXHAUST AIR STREAM to the AIR HANDLER COLD AIR RETURN



⚠ CAUTION

Weather hood arrangement - requires a minimum of 6' (2m) separation and a minimum of 18" (460mm) clearance above grade or anticipated snow level.

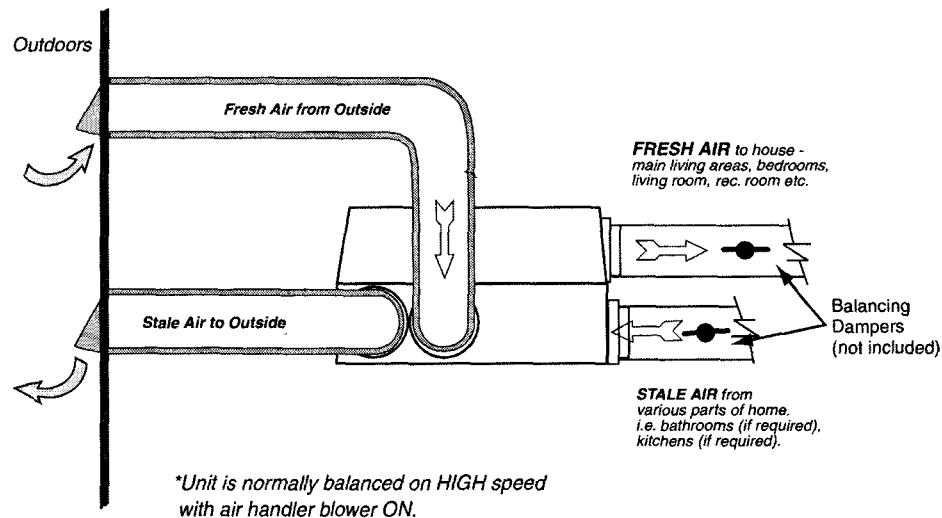
Fully Dedicated Installation

Fully Dedicated System for HRV

- Stale air drawn from key areas of home (bathroom, kitchen, laundry)
- Fresh air supplied to main living areas of home

⚠ WARNING

HRV must be balanced. Refer to "Airflow Balancing" in this manual.



NOTES:

1. Weather hood arrangement is for drawing purposes only. 6' (2m) minimum separation required.
18" (460mm) above grade minimum or above anticipated snow level .
2. The HRV air flow must be confirmed on site, using the balancing procedure found in the installation manual.

⚠ CAUTION

Weather hood arrangement - requires a minimum of 6' (2m) separation and a minimum of 18" (460mm) clearance above grade or anticipated snow level.

Optional Controls

Dehumidistat Ventilation Control

The Dehumidistat Ventilation Control (DVC) is a main HRV control and should be located in a central "easy access" location i.e. beside the thermostat. Do not install more than one main control or dehumidistat on a system.

Mode of Operation Switch - The "small fan" position initiates low speed ventilation and the "large fan" position initiates high speed ventilation.

ON/OFF Switch - The "single house without arrows" is the OFF position. The HRV will not function in this position. The circuit board DIP switches can be adjusted to change the OFF position to Standby (refer to "Fan Speed DIP Switch Settings" in this manual).

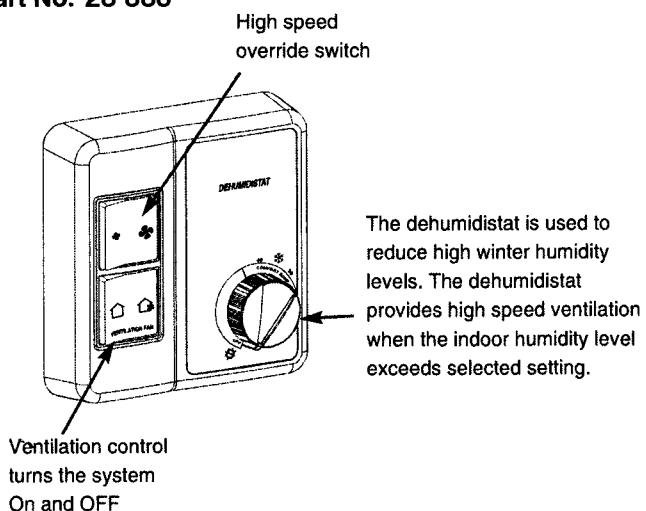
The "single house with arrows" is the ON position. This enables Lo/Hi Fan Speed and complete control functionality.

- Remove jumper between red and orange on circuit board when connecting this control.
- Use 3 lead 18 gauge wire (low voltage) for the control connections.

- Connects to red, black and orange circuit board terminals (refer to "Wiring the Controls") in this manual.

See "Fan Speed DIP Switch Settings" for Standby Configuration.

Part No. 28 883

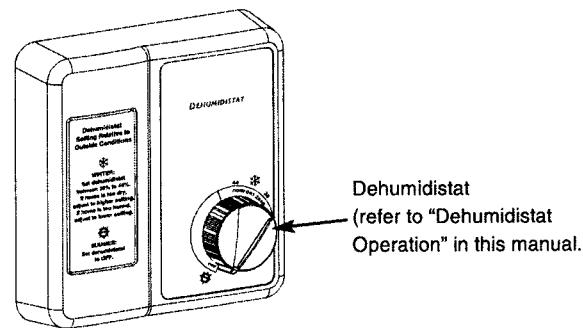


Remote Dehumidistat

The Remote Dehumidistat should be located in a central "easy access" location i.e. beside the thermostat. Do not install more than one dehumidistat on a system. Use 2 lead 18 gauge wire (low voltage) for the control connections.

- Connects to red and black circuit board terminals (refer to "Wiring the Controls") in this manual.

Part No. 28 882 White

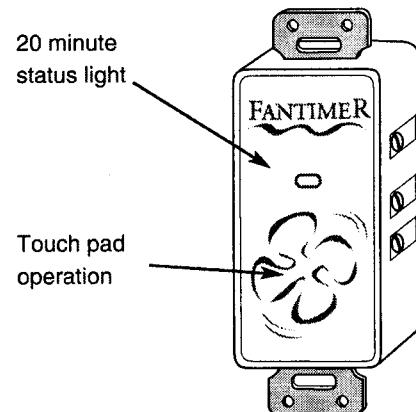


20 Minute Timer

The 20 Minute Timer initiates high speed ventilation for 20 minutes. Install one of these controls at each exhaust location (bathroom, laundry, kitchen etc.).

- Install up to 4 timers on a system.
- Use 3 lead 18 gauge wire (low voltage) for the control connections.
- Connects to black, red and green circuit board terminals (refer to "Wiring the Controls") in this manual.
- Maximum total wire length is 100'.

Part No. 28 884



Dehumidistat Operation (HRV only)

An HRV has a dehumidifying effect whenever outdoor air temperatures approach and exceed freezing. Under these conditions outdoor air is always drier than indoor air. This is why the dehumidistat should only be used during the winter heating season. The dehumidistat dial should be turned fully counter-clockwise to the "OFF" position all other times of the year.

The Dehumidistat switches the HRV to high speed when the moisture level in the building exceeds the desired set-

point. When the humidity level has been reduced below the set point the Dehumidistat disengages and switches the HRV back to the previous setting.

The Dehumidistat dial has a selector knob with set points ranging from 20% to 80% relative humidity (RH). Most people are comfortable when indoor relative humidity levels are in a range from 30 to 45%. Do not install more than one Dehumidistat on a system.

Defrost Operation

Damper Defrost

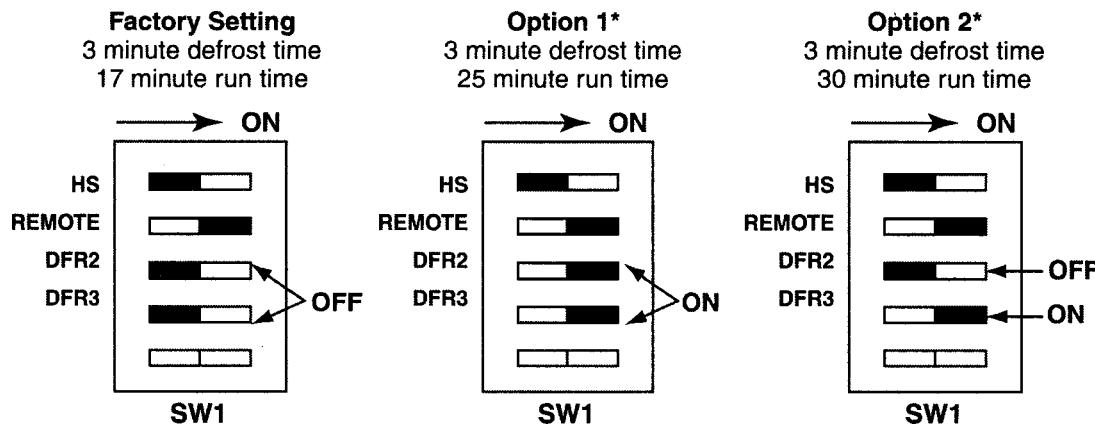
The damper defrost HRV has an electronically controlled damper defrost mechanism. The defrost timer is activated when the outside temperature drops below 27°F (-3°C). A motor driven damper door mechanism closes off the supply air from outside allowing the exhaust air to recirculate through the unit. After the defrost period, the damper operates in the opposite direction to reopen the fresh air port. Defrost cycle repeats until the temperature again rises above 27°F (-3°C).

CAUTION

Lengthening the run time may result in ice buildup on the core.

Defrost Cycle DIP Switch Settings

Defrost DIP Switch Settings (located on the circuit board) can be adjusted to increase the unit's run (ventilation) time. The three minute defrost time cannot change.



*Lengthening the run time may result in ice build-up on the core.

Operation

Self Test

The ventilator will automatically initiate a self test sequence when power is applied. Fan motor is cycled and then damper motor is cycled. Duration: Approximately 1.5 mins.

How much ventilation do I need?

During seasons when your windows and doors are closed (winter and summer if air conditioned) the HRV should operate continuously when the dwelling is occupied, and either continuously or intermittently when not occupied.

For most installations the HRV will normally be set to operate continuously on low speed. To suit various lifestyles, the HRV offers a selection of operating modes.

Method of Operation

- Good** - intermittent operation at all times
- Better** - continuous operation during day or occupied conditions, intermittent at night or unoccupied
- Best** - recommended continuous operation of both HRV and furnace/air handler blower

Fan speed DIP Switch Settings

Figure 1 - Factory DIP Switch Settings

The factory setting of the DIP switches (located on the circuit board) provides continuous low speed ventilation. Optional Remote Controls will initiate high speed ventilation.

Remote controls with an ON/OFF switch (refer to "Remote Control Devices" in this manual) will shut the entire system down when the remote control is in the OFF position. Changing the remote control from OFF to STANDBY (no low speed continuous fan) can be achieved by Setting the DIP Switch as per Figure 2.

Figure 1

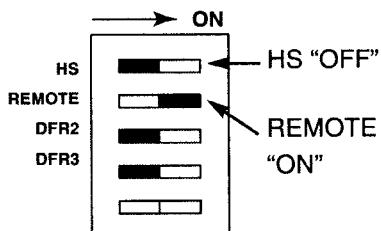
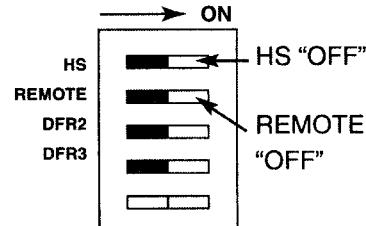


Figure 2-DIP Switch Settings for Standby (When using a Remote Control Device that has an ON/OFF Switch)

This DIP Switch Setting can be adjusted when using a system control that has an ON/OFF switch (refer to "Remote Control Devices" in this manual). "STANDBY" is achieved when the Remote Control Switch is in the "OFF" position. The Dehumidistat and Timers will initiate high speed ventilation regardless of the "ON/OFF" switch position when this DIP switch configuration is used.

Figure 2



ATTENTION

Figure 2 may not meet building code conformance in certain geographical areas. Check with your local building authority.

Electrical

The HRV unit should be plugged into a standard designated (120VAC) electrical outlet with a ground. The outlet should be serviced by a separate 15 amp/120V circuit. An extension cord should not be used with this appliance. A qualified service technician should make any required electrical connections.

Remote Control Connections

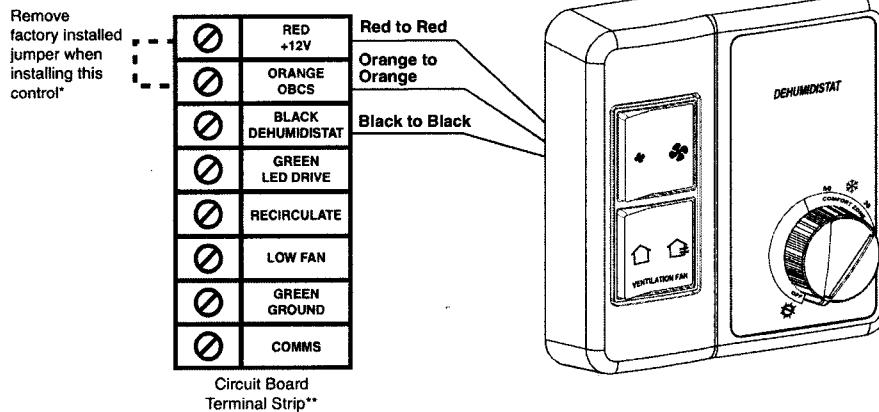
Low voltage connections between the remote controls, the dehumidistat, or the fan timer should be made by a qualified service technician. Low voltage wires from the remote controls are connected to the HRV micro-processor board.

WARNING

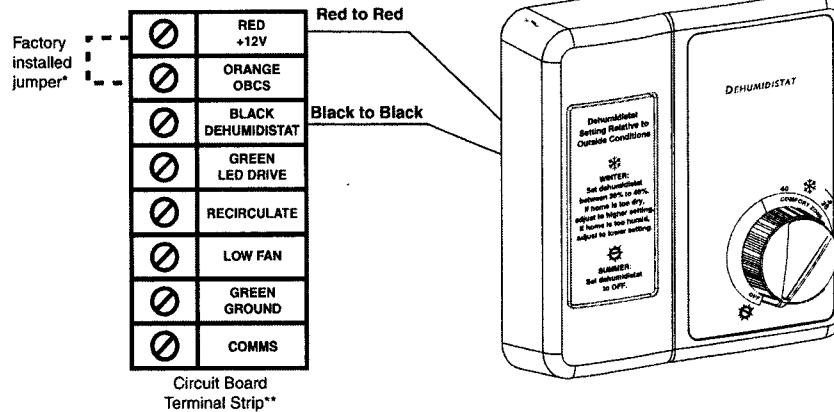
In order to prevent electric shock when cleaning or servicing the HRV, it is extremely important to confirm the polarity of the power line that is switched by the safety (disconnect) switch. The hot line (black) is the proper line to be switched. To confirm the proper polarity, use a voltmeter or test lamp to ensure there is no power after the switch when the door is open. Check between that point and ground (on the cabinet). Always make sure that the HRV is properly grounded.

Wiring the Controls

Dehumidistat Ventilation Control (DVC)

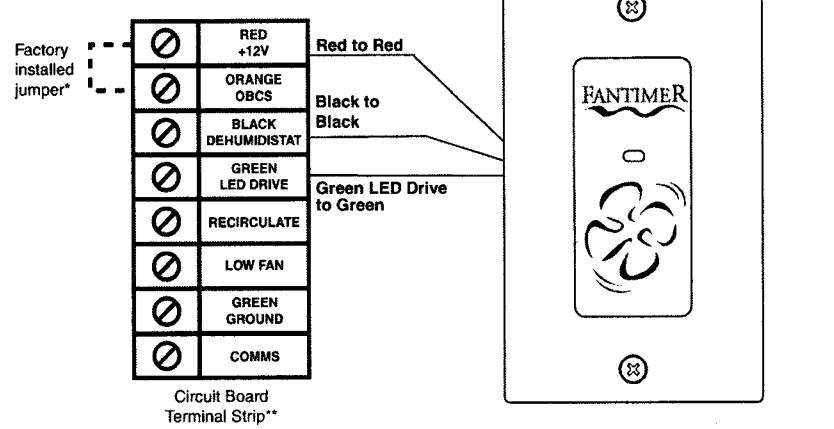


Remote Dehumidistat



20 Minute Timer

(shown in a Decora Cover Plate)***



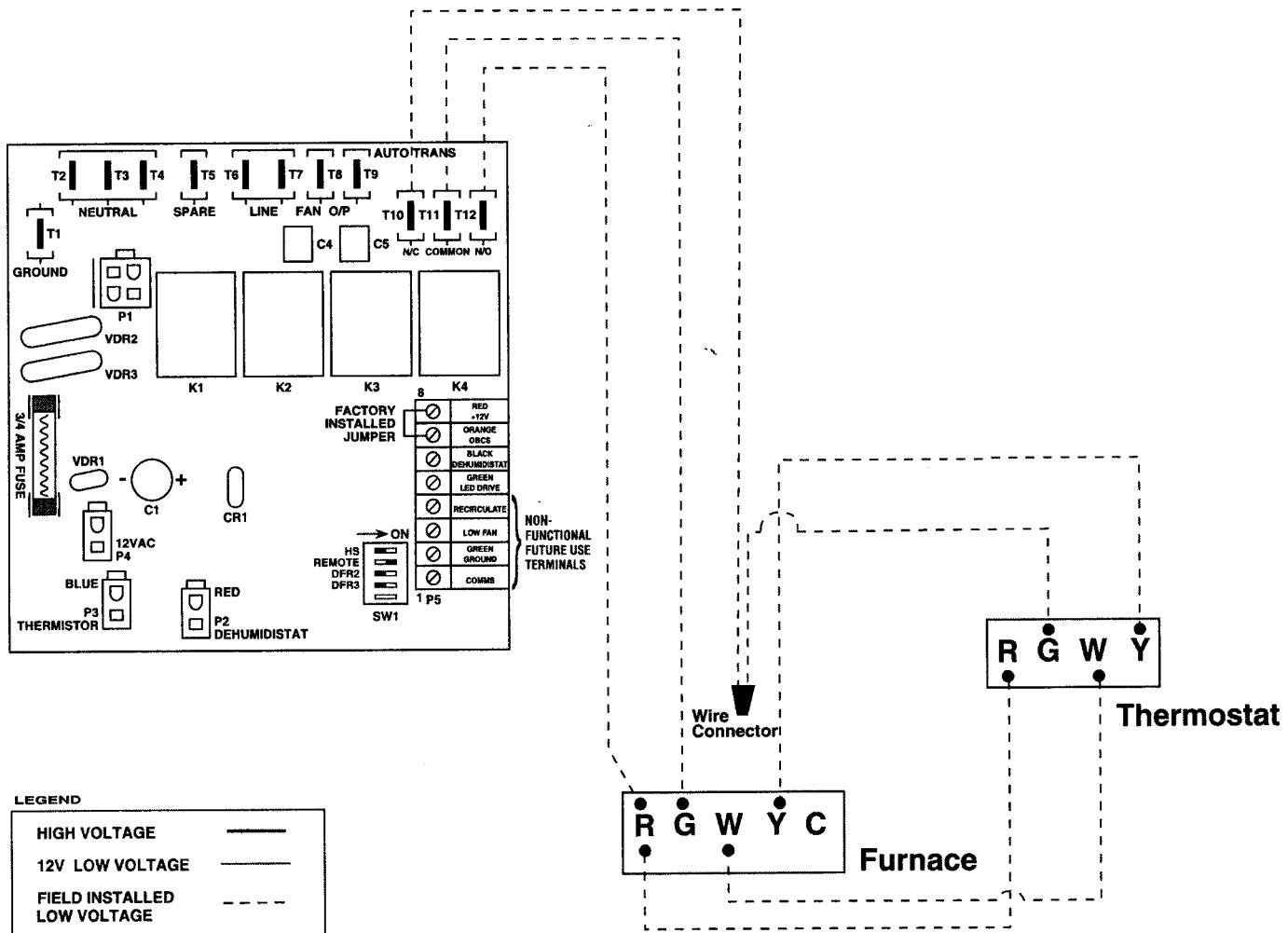
- * The Factory Installed Jumper must be removed if there is a control with ON/OFF Switch Installed.
- ** The Circuit Board Terminal Strip is located in the electrical box of the unit. Be sure to unplug the unit when connecting the wiring.
- *** The Decora Cover Plate (Part No. 99-107W) is a standard switch cover plate.

Optional Controls

Connecting the HRV as illustrated will ensure the Air Handler/Furnace Blower Motor is operating whenever the HRV is ventilating.

CAUTION

Consideration must be given to competing airflows when connecting the HRV/ERV in conjunction with an Air Handler/Furnace Blower system.



Air Flow Balancing

It is necessary to have balanced air flow in an HRV. The volume of air brought in from the outside must equal the volume of air exhausted by the unit. If the air flow is not properly balanced, then:

- The HRV may not operate at its maximum efficiency
- A negative or positive air pressure may occur in the house
- The unit may not defrost properly
- Failure to balance HRV properly may void warranty

The first step is to operate all mechanical systems on high speed, which have an influence on the ventilation system, i.e. the HRV itself and the air handler, if applicable. This will provide the maximum pressure that the HRV will need to overcome, and allow for a more accurate balance of the unit.

Drill a small hole in the duct (about 3/16"), three feet downstream of any elbows or bends, and one foot upstream of any elbows or bends. These are recommended distances but the actual installation may limit the amount of straight duct.

The Pitot tube should be connected to a magnehelic gauge or digital manometer capable of reading from 0 to 0.25 in. (0-62 Pa) of water, preferably to 3 digits of resolution. The tube coming out of the end of the Pitot is connected to the high pressure side of the gauge. The tube coming out of the branch of the Pitot is connected to the low pressure or reference side of the gauge.

Insert the Pitot tube into the duct; pointing the tip into the air flow.

For general balancing it is sufficient to move the Pitot tube around in the duct and take an average or typical reading. Repeat this procedure in the other (supply or return) duct. Determine which duct has the highest air flow (highest reading on the gauge). Then damper that air flow back to match the lower reading from the other duct. The flow should now be balanced.

Actual air flow can be determined from the gauge reading. The value read on the gauge is called the velocity pressure. The Pitot tube comes with a chart that will give the air flow velocity based on the velocity pressure indicated by the gauge. This velocity will be in either feet per minute or meters per second. To determine the actual air flow, the velocity is multiplied by the cross sectional area of the duct being measured.

This is an example for determining the air flow in a 6" duct.

The Pitot tube reading was 0.025 inches of water.

From the chart, this is 640 feet per minute.

$$\begin{aligned} \text{The 6" duct has a cross sectional area of} \\ &= [3.14 \times (6 \div 12)^2] \div 4 \\ &= 0.2 \text{ square feet} \end{aligned}$$

The air flow is then:

$$640 \text{ ft./min.} \times 0.2 \text{ square feet} = 128 \text{ cfm}$$

For your convenience, the cross sectional area of some common round duct is listed below:

DUCT DIAM. (inches)	CROSS SECTION AREA (sq. ft.)
5	0.14
6	0.20
7	0.27

The accuracy of the air flow reading will be affected by how close to any elbows or bends the readings are taken. Accuracy can be increased by taking an average of multiple readings as outlined in the literature supplied with the Pitot tube.

Excessive negative pressure may have several undesirable effects. In some geographic locations, soil gases such as methane and radon gas may be drawn into the home through basement/ground contact areas.

Read the Application Warning in Clearances & Requirements section of this manual!

⚠ WARNING

Ensure balanced air flow in HRV. **Excessive negative pressure** may also cause the back-drafting of vented combustion equipment.

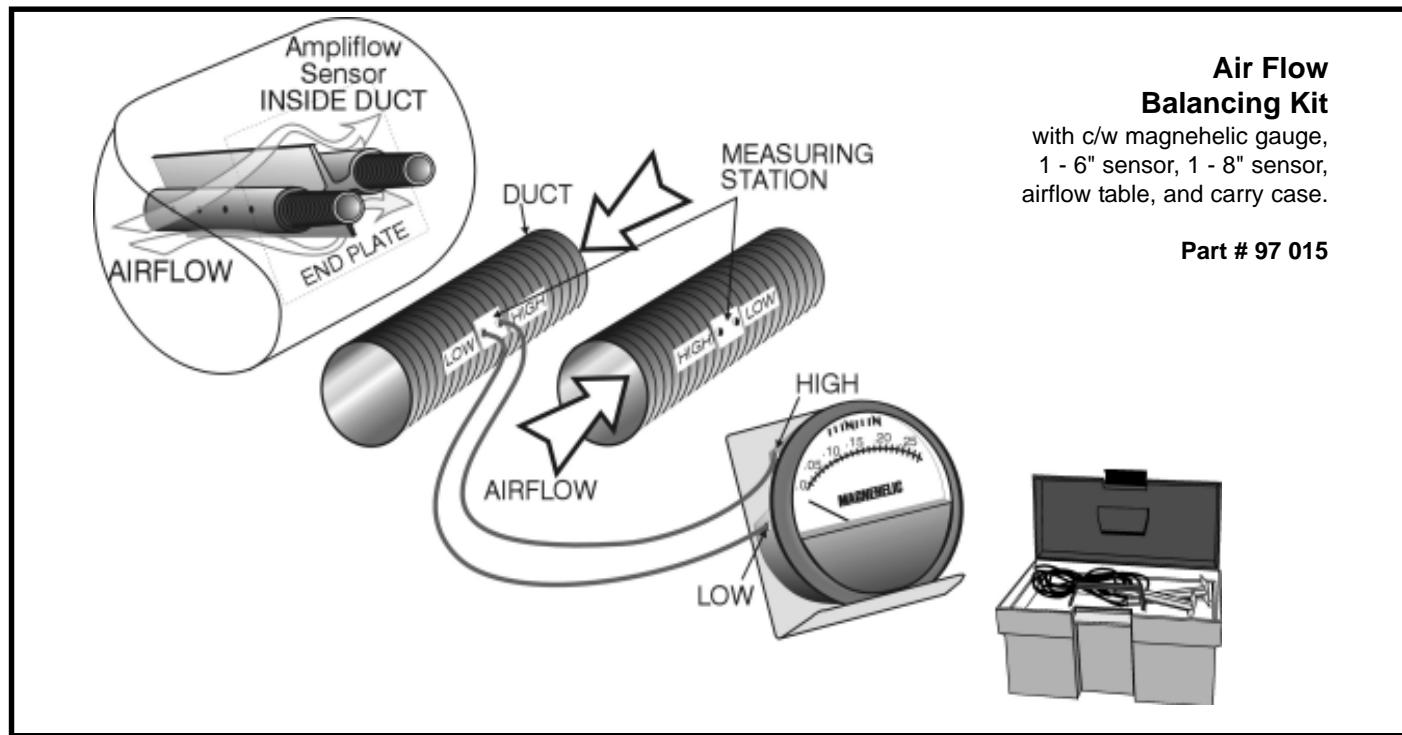
Prior to balancing, ensure that:

1. All sealing of the duct system has been completed.
2. All of the HRV's components are in place and functioning properly.
3. Balancing dampers are fully open.
4. Unit is on HIGH speed.
5. Air flow in branch lines to specific areas of the house should be adjusted first prior to balancing the unit. A smoke pencil used at the grilles is a good indicator of each branch line's relative air flow.
6. After taking readings of both the stale air to the HRV duct and fresh air to the house duct, the duct with the lower CFM ([L/s] velocity) reading should be left alone, while the duct with the higher reading should be dampered back to match the lower reading.
7. Return unit to appropriate fan speed for normal operation
8. A field-supplied balancing damper for the stale air side is required for system balancing.

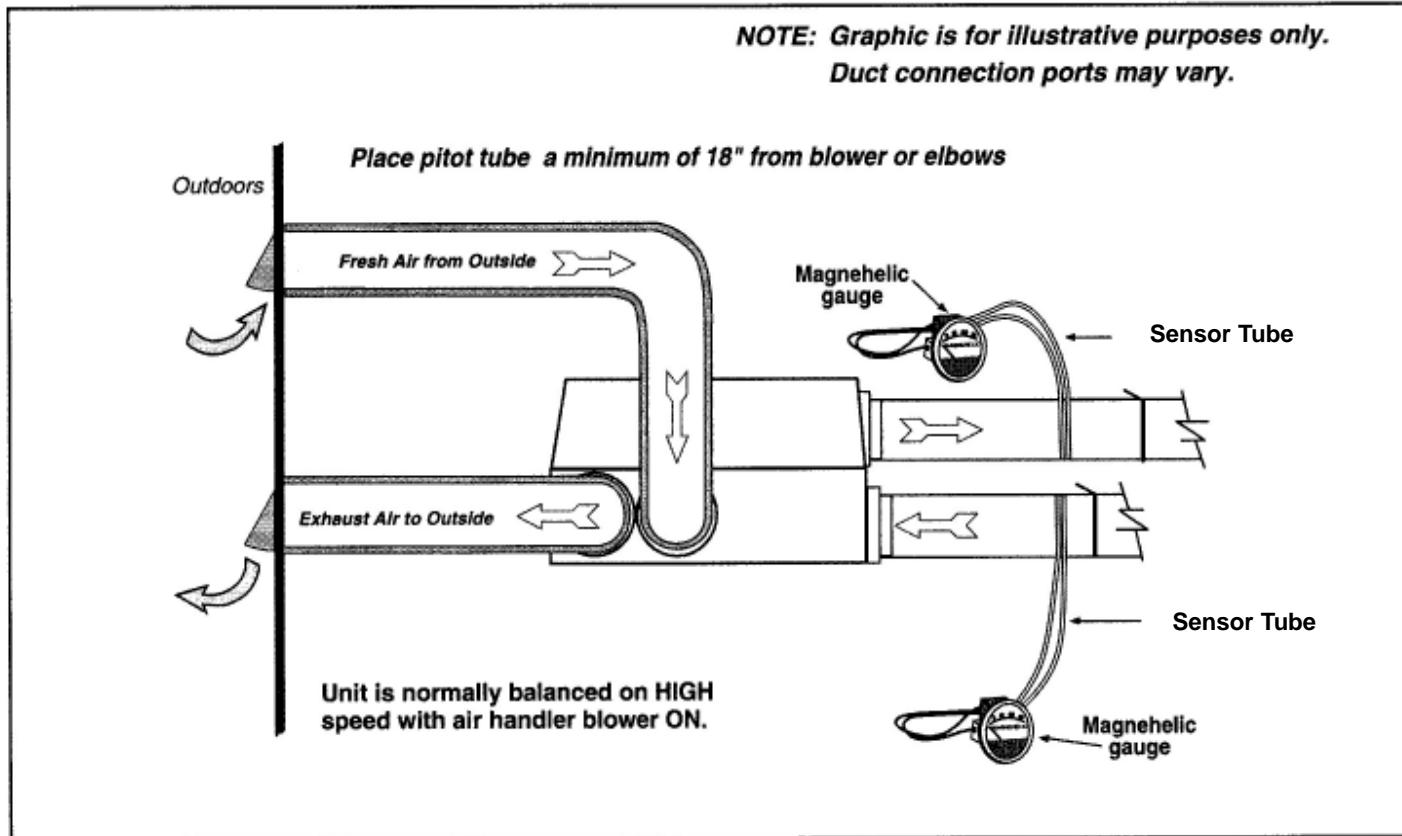
Balancing Procedure

The following is a method of field balancing an HRV using a Pitot tube, which is advantageous in situations when flow stations are not installed in the duct system. Procedure should be performed with the HRV on high speed.

Pitot Tube and Gauge



Placement of Pitot Tube HRV



Troubleshooting

Symptom	Cause	Solution
Poor Air Flow	<ul style="list-style-type: none"> • 1/4" (6mm) mesh on the outside hoods is plugged • filters plugged • core obstructed • house grilles closed or blocked • dampers are closed if installed • poor power supply at site • duct is restricting HRV • improper speed control setting • HRV air flow improperly balanced 	<ul style="list-style-type: none"> • clean exterior hoods or vents • remove and clean filter • remove and clean core • check and open grilles • open and adjust dampers • have electrician check supply voltage at house • check duct installation • increase the speed of the HRV • have contractor balance HRV
Supply air feels cold	<ul style="list-style-type: none"> • poor location of supply grilles, the air flow may irritate the occupant • outdoor temperature extremely cold 	<ul style="list-style-type: none"> • locate the grilles high on the walls or under the baseboards, install ceiling mounted diffuser or grilles so as not to directly spill the supply air on the occupant (eg. over a sofa) • turn down the HRV supply speed. A small duct heater (1kw) could be used to temper the supply air • placement of furniture or closed doors is restricting the movement of air in the home • if supply air is ducted into air handler return, the air handler fan may need to run continuously to distribute ventilation air comfortably
Dehumidistat is not Operating	<ul style="list-style-type: none"> • improper connection to ventilator • external low voltage is shortened out by a staple or nail • check dehumidistat setting it may be on OFF 	<ul style="list-style-type: none"> • check that the correct terminals have been used • check external wiring for a short • set the dehumidistat at the desired setting
Humidity Levels are too High in Winter Condensation is appearing on the windows	<ul style="list-style-type: none"> • dehumidistat is set too high • lifestyle of the occupants • moisture coming into the home from an unvented or unheated crawl space • moisture is remaining in the washroom/bathroom and kitchen areas • condensation seems to form in the spring and fall • HRV is set at too low a speed 	<ul style="list-style-type: none"> • set dehumidistat lower • avoid hanging clothes to dry, storing wood and venting clothes dryer inside. Heating wood may have to be moved outside • vent crawl space and place a vapor barrier on the floor of the crawl space • ducts from the washroom/bathroom should be sized to remove moist air as effectively as possible, use of a washroom/bathroom fan for short periods will remove additional moisture • timer or fan can be added to washroom/bathroom exhaust • on humid days, as the seasons change, some condensation may appear but the home's air quality will remain high with some HRV use • increase speed of the HRV
Humidity Levels are too Low	<ul style="list-style-type: none"> • dehumidistat control set too low • blower speed of HRV is too high • lifestyle of occupants • HRV air flow may be improperly balanced 	<ul style="list-style-type: none"> • set dehumidistat higher • decrease HRV blower speed • humidity may have to be added through the use of humidifiers • have a contractor balance HRV air flow
HRV and / or Ducts Frosting up	<ul style="list-style-type: none"> • HRV air flow is improperly balanced • malfunction of the HRV defrost system 	<ul style="list-style-type: none"> • Note: minimal frost build-up is expected on cores before unit initiates defrost cycle functions • have HVAC contractor balance the HRV • ensure working properly.
Condensation or Ice Build Up in Insulated Duct to the Outside	<ul style="list-style-type: none"> • incomplete vapor barrier around insulated duct • a hole or tear in outer duct covering 	<ul style="list-style-type: none"> • tape and seal all joints • tape any holes or tears made in the outer duct covering • ensure that the vapor barrier is completely sealed
Water in the bottom of the HRV	<ul style="list-style-type: none"> • drain pans plugged • improper connection of HRV drain lines • HRV is not level • drain lines are obstructed • HRV heat exchange core is not properly installed 	<ul style="list-style-type: none"> • ensure O-Ring on drain nozzle sits properly • look for kinks in line • check water drain connections • make sure water drains properly from pan

Maintenance

1. Inspect Exterior Hoods at least once a month.

Make sure exhaust and fresh air supply hoods are not blocked or restricted by leaves, grass, or snow. In winter, it is especially important to make sure snow is not blocking the hoods or that frost has not built up on the wire mesh (bird screen).

WARNING: Blockage of hoods may cause an imbalance.

2. Clean Air Filters - Twice a Year

The standard filters equipped with your HRV are removable and washable.

- a) simply open access door and slide core out
- b) remove filters
- c) rinse with water or a combination of mild soap and water. Do not clean in the dishwasher
- d) to re-assemble, place clean filter(s) (wet or dry) back into their positions against the core and return clips to their original position
- e) slide core back into its original position

3. Clean Core - Twice a Year

- a) open access door
- b) rotate keeper clips and carefully grip ends of core and pull evenly outward.
-core may be snug, but will slide out of the channel
- c) once removed from the cabinet remove filters
- d) wash core in warm soapy water
(do not use dishwasher)
- e) install clean core
- f) install the clean filters

Note: Core installation label on the outer end of the core.

To install the clean core:

- a) first mount the bottom flange of the core guide into the bottom H channel approximately 1/4" (6mm)
- b) mount the left or right side flange of the core guide approximately 1/4" (6mm) followed by the other side
- c) mount the top flange of the core guide into the top H channel approximately 1/4" (6mm)
- d) with all four corners in place and the core straight and even, push hard in the center of the core until the core stops on the back of the cabinet
- e) rotate core clips to lock core in place

NOTE: Core will appear to stick out from cabinet approximately 1/8" (3mm). This is designed this way so that the access door will fit tight against the core.

4. Motors - Maintenance Free

5. Drain (condensate) Line - Clean Once a Year

Inspect drain line, drain spout and "P" trap for blockage, mold or kinks. Flush with warm soapy water and replace if worn, bent or unable to clean.

6. Clean Duct System If Required

The duct system running to and from the HRV may accumulate dirt. Wipe and vacuum the duct once every year. You may wish to contact a Heating/Ventilation company to do this.

7. General Maintenance - Twice a Year

Wipe down the inside of the cabinet with a damp cloth to remove dirt, bugs and debris that may be present. Pay special attention to the drain pan and ensure water flow path is not blocked.

8. Cleaning the Fans

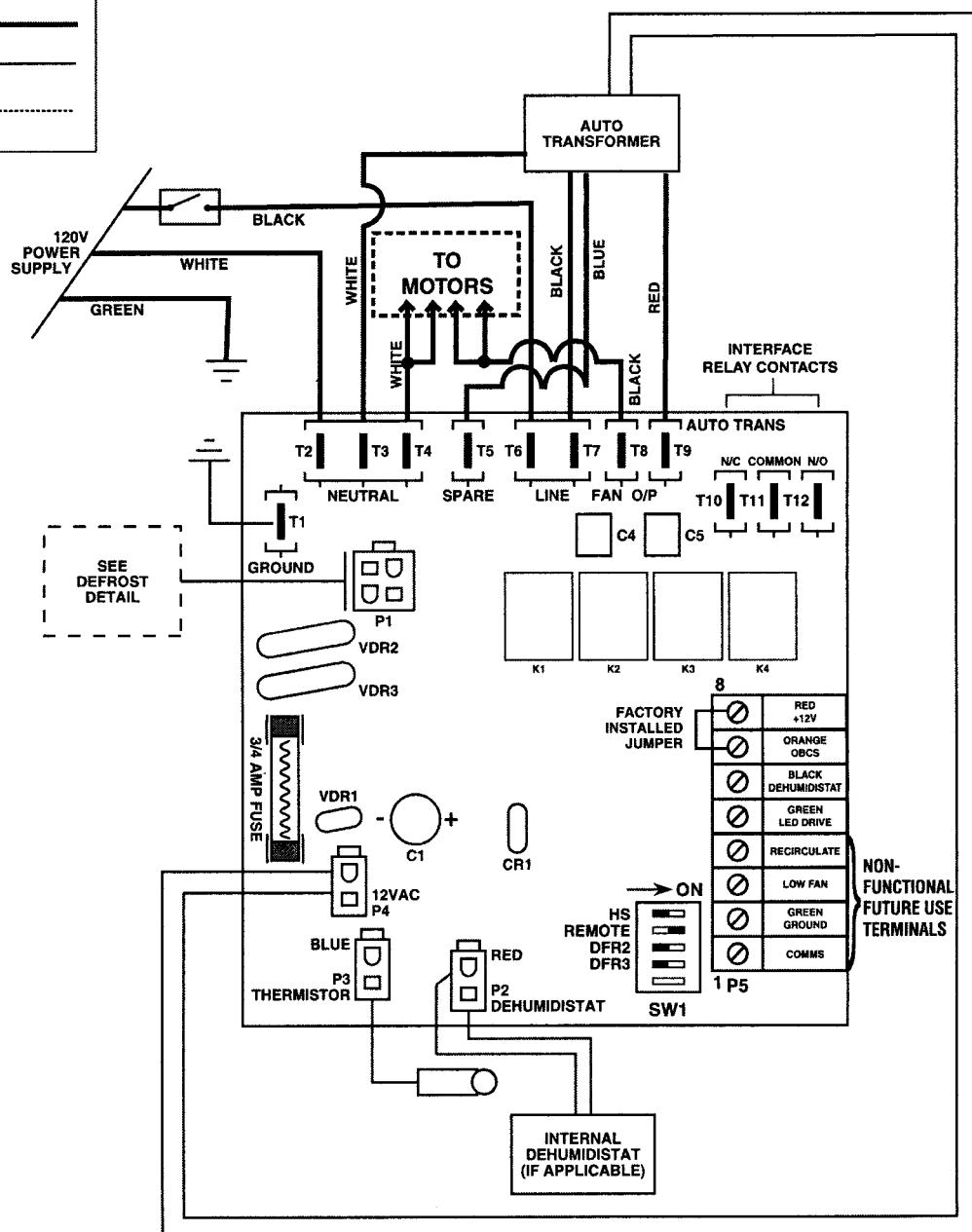
Fans may accumulate dirt causing an imbalance and/or excessive vibration of the HRV. A reduction in the air flow may also occur. In new construction this may result within the first year due to heavy dust and may occur periodically after that over time depending on the outdoor conditions.

- unplug the HRV and open the service door
- remove the core
- use a small brush, such as a toothbrush or pipe cleaner, and insert first. Scrub individual fan blades until clean. Avoid moving or damaging balancing flat weight, clip is usually found on one or more of the fan blades
- vacuum and wipe

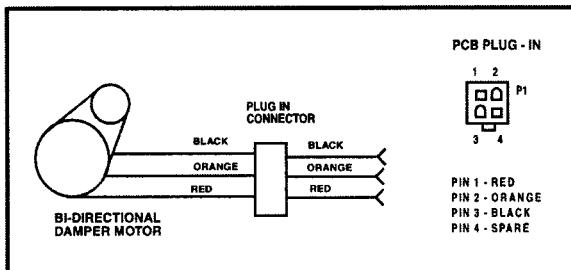
Before attempting this task, thought should be given to having a qualified service technician complete the service work.

LEGEND

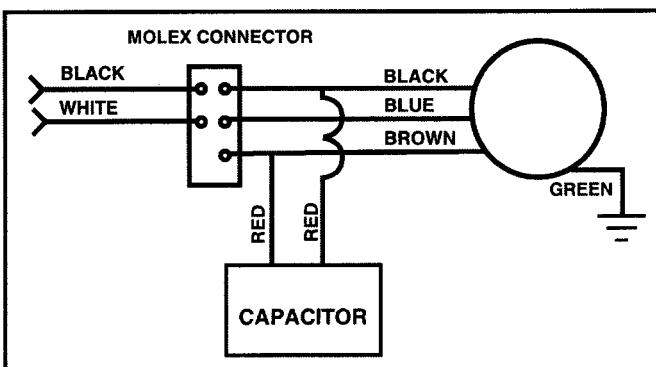
HIGH VOLTAGE	—
12V LOW VOLTAGE	— —
FIELD INSTALLED 12V LOW VOLTAGE



DEFROST DETAILS



FAN MOTOR DETAILS



Notes

Maintenance Record

Note: It is important to maintain this product regularly to ensure optimal performance.

